

REMARKS

The limitations of original claim 5 have been added to amended claim 1. The minimum value for n in the surfactant formula of claim 1 has been changed to 3. Support is found on page 11, lines 5-7. Claims 3-6 are canceled.

Cancellation of claims 4-6 requires that two inventors (Vidal and Wehner) be dropped from the application. A petition under 37 CFR 1.48(b) accompanies this response.

Claims 1 and 7-21 are pending in the application. They stand rejected under 35 U.S.C. 103(a) as being unpatentable over the combined disclosures of van Cleeff (WO 99/55746) and Kahn (US 4,524,197).

Applicants' invention, as defined in amended Claim 1, is an emulsion polymerization process for manufacturing an isolated fluoroelastomer. The process employs a fluorinated sulfonate surfactant of the formula $F-(CF_2CF_2)_n-CH_2CH_2SO_3M$ where n is an integer from 3 to 9, or mixtures thereof, and M is a cation having a valence of 1. Fluoroelastomer is isolated from the dispersion by addition of an aluminum sulfate or alum coagulating agent (step D of amended Claim 1).

Applicants have noted that when common coagulating agents such as calcium or magnesium salts are employed in the process of this invention, the fluorinated sulfonate surfactant having more than 4 carbon atoms in the perfluoroalkyl group (i.e. when n is 3-9) forms an insoluble salt with the coagulating agent and drops out of solution. Thus, the surfactant becomes entrained in the fluoroelastomer. This may adversely affect fluoroelastomer processability (e.g. sheeting, pellet formation, and mixing), vulcanization and the physical properties of vulcanized elastomers.

Surprisingly, Applicants have found that aluminum sulfate and alums may be employed as coagulating agents in the process of this invention without causing the surfactant to drop out of solution and become entrained in the fluoroelastomer crumb (page 16, lines 2-16).

The van Cleeff reference (WO-746) discloses processes for the manufacture of fluoroelastomer latices (or emulsions), not isolated fluoroelastomers. In a latex, it is preferred that elastomer particles not readily separate from the aqueous medium, whereas Applicants desire to separate the fluoroelastomer from water, without causing the surfactant to become entrained in the fluoroelastomer. The processes disclosed in van Cleeff lack step D) of amended Claim 1 of the present invention.

Khan (US-197) discloses the polymerization of fluoroelastomers in the presence of a fluorosulfate surfactant ($\text{F}-(\text{CF}_2\text{CF}_2)_n-\text{CH}_2\text{CH}_2-\text{O}-\text{SO}_3\text{M}$), not the fluorosulfonate ($\text{F}-(\text{CF}_2\text{CF}_2)_n-\text{CH}_2\text{CH}_2-\text{SO}_3\text{M}$) surfactant employed in the instant invention. In col. 4, lines 45-68, Khan discloses that alkaline earth metal salts may be used to coagulate a fluoroelastomer latex. Specific examples given include the salts of calcium or magnesium with nitrates, chlorites and acetates.

Khan does not disclose that alums and aluminum sulfate may be employed to coagulate fluoroelastomer dispersions, nor does he disclose that such aluminum salts would be the preferred coagulating agents when the fluorosurfactant employed in Applicants' invention is present in the dispersion. Otherwise, insoluble fluorosurfactant salts become entrained in the fluoroelastomer crumb. Thus, the combination of the van Cleeff and Khan references does not render Applicants' claimed invention obvious under 35 U.S.C. 103(a).

In view of the above amendments and remarks, Applicants believe that claims 1 and 7-21 are patentable and that the application is in condition for allowance. Reconsideration is requested.

Respectfully submitted,



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